

**ABSTRACT**

A method for estimating a location of a most-likely photon source on a scintillator block includes obtaining a measured photodetector signal indicative of a distribution of photons received by a plurality of photodetectors from a photon source on a scintillator block; and obtaining a measured fiber signal indicative of a distribution of photons  
5 received by a plurality of wavelength-shifting fibers extending across the scintillator block from a photon source on a scintillator block.